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(54) Safety knife

(57) A handy safety knife comprises a generally flat holder 10 having a chamber and an opening both defined therein, an elongated blade member 36, a manipulatable member 26 carried by the holder for movement between projected and retracted positions and operatively coupled to the blade member, a spring element for biasing the manipulatable member to the retracted position to hold the blade member in position to be concealed within the chamber, and, if desired, a wedge member for retaining the manipulatable member in the projected position once it has been moved thereto.

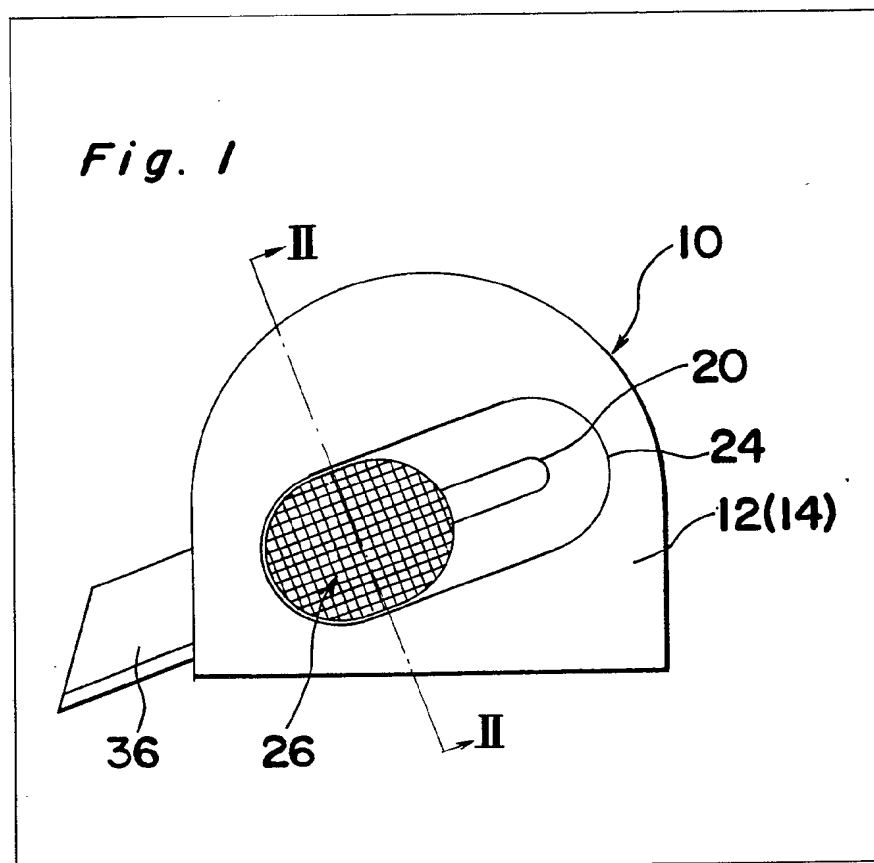


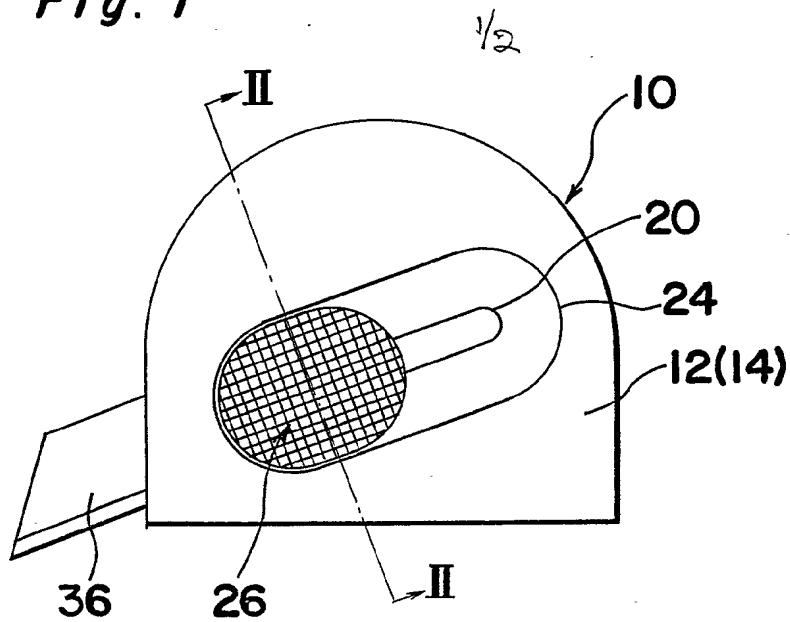
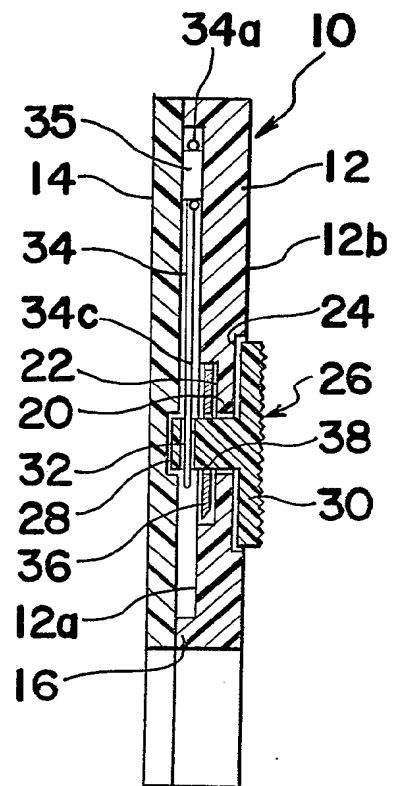
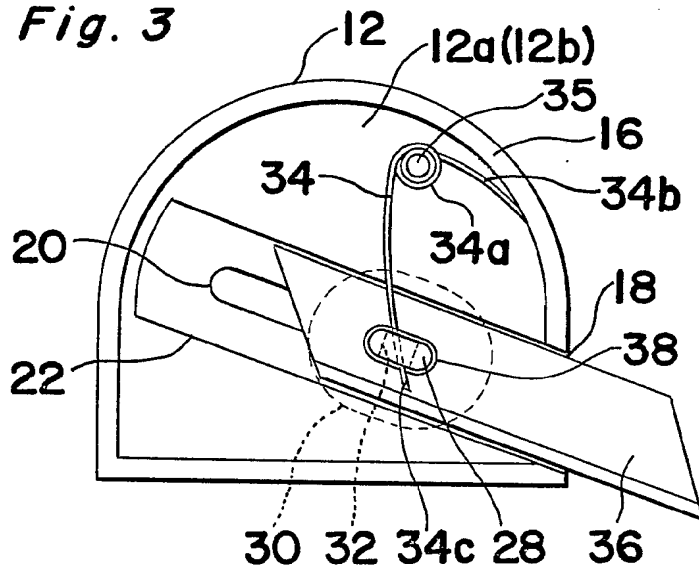
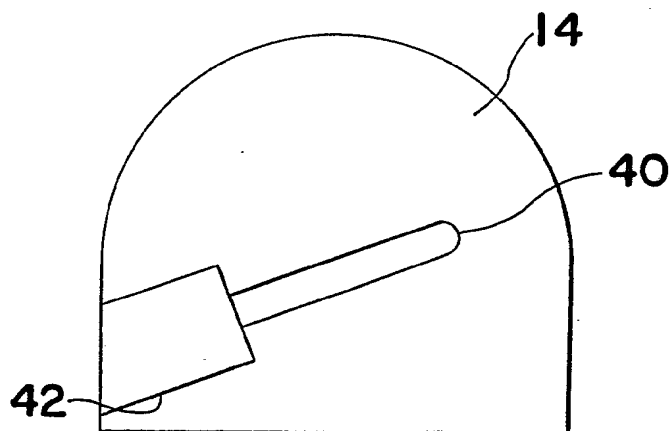
Fig. 1*Fig. 2**Fig. 3**Fig. 4*

Fig. 5

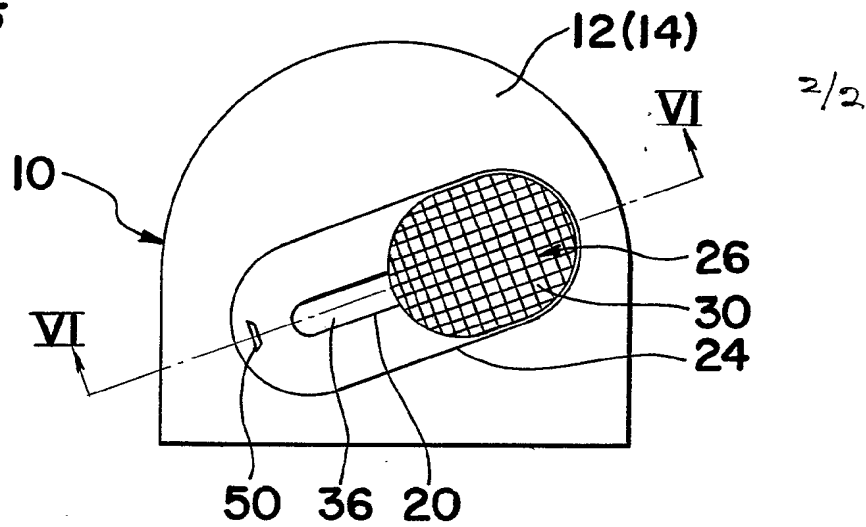


Fig. 6

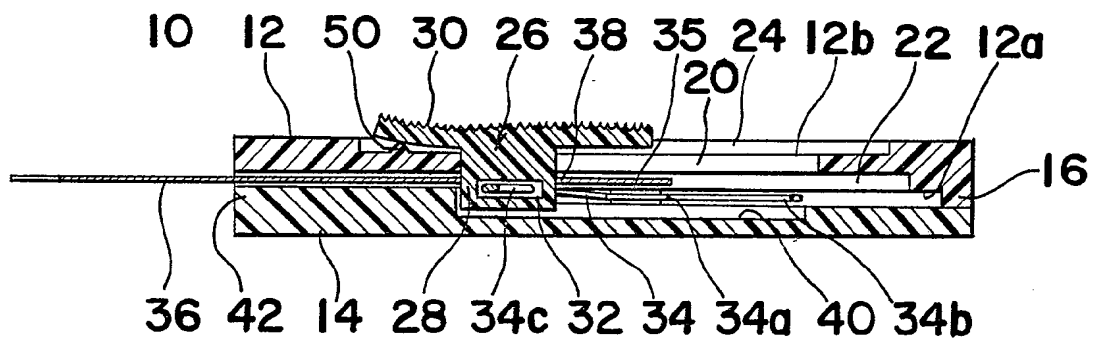


Fig. 7

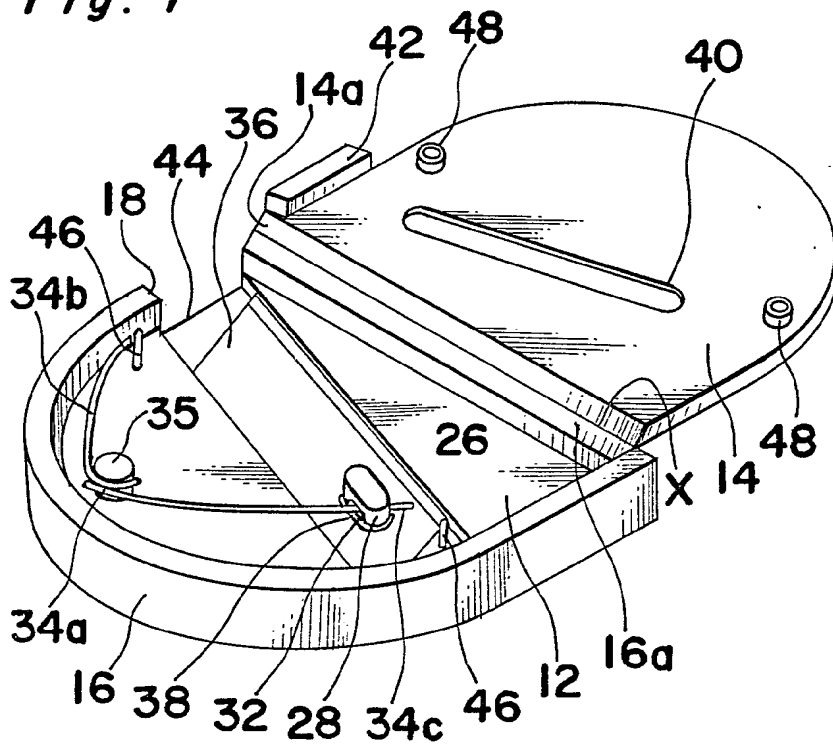
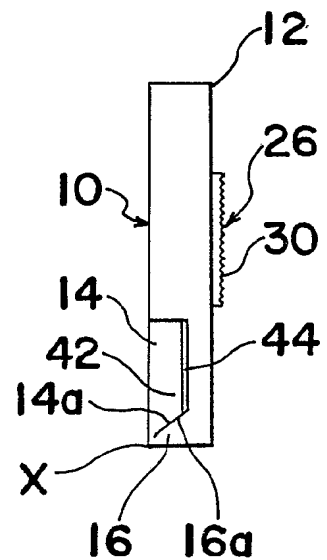


Fig. 8



SPECIFICATION

Safety knife

5 The present invention generally relates to a safety knife, for example to knives suited for use in paper cutting, pencil sharpening and like handicraft works and, more particularly, to a handy safety knife of a type having a knife blade automatically concealable
10 when not in use.

Various knives are well known and currently commercially available. So far as the capability of the knife blade being concealed within the holder is involved, there is well known a safety knife of a type
15 which comprises an elongate holder having a guide groove of a cross section similar in shape to a substantially flattened figure "C", an elongate blade member inserted in the guide groove for movement in a direction lengthwise of the blade member, and a
20 manipulatable member having a portion exposed outside the holder through an axially extending slit in the holder and another portion coupled to the blade member. In this conventional safety knife, by applying an external force to the manipulatable
25 member in a direction lengthwise of the blade member, the blade member can be selectively projected from and retracted into the guide groove in the holder. While the continued application of the external force is required to maintain the blade
30 member in a position projected outwards from the holder when in use, an elastic tongue is integrally formed with the another portion of the manipulatable member and is so frictionally engaged to a wall defining the guide groove that, when the blade
35 member is retracted into the guide groove, it can be held in the retracted position.

The conventional safety knife of the above described construction is satisfactory in many respect, but some disadvantages are involved. One of them
40 is the possibility that, when the safety knife is accidentally shaken with the opening of the guide groove pointed outwards, the blade member in the retracted position will project outwards through the opening of the guide groove. Therefore, the user of
45 the conventional safety knife is exposed to dangers when the blade member is exposed to the outside of the holder in the manner described above. Although the increased friction between the elastic tongue and the wall defining the guide groove may avoid this
50 possibility, this brings such an adverse effect as to require the application of the correspondingly increased external force in moving the blade member between the projected and retracted positions.

Another disadvantage is that, since the blade
55 member is constituted by a razor blade which is specially designed for use in shaving, not only is the conventional safety knife bulky in size, but the conventional safety knife also has an unattractive appearance.

60 A further disadvantage resides in that, since the conventional safety knife including the holder is made of a metallic material, not only is the manufacture thereof complicated, but also it requires a relatively high manufacturing cost. Although the use
65 of a synthetic resin can be contemplated as a

material for the holder, the duration of the knife would be reduced or the magnitude of friction required to be developed between the elastic tongue and the wall defining the guide groove would be
70 reduced, because of the frictional wear of that portion of the holder which is held in contact.

The present invention has been developed in view to allow such of the above described disadvantages inherent in the conventional safety knife to be
75 substantially eliminated as may be desired and provides a safety knife of a type having a knife blade which can automatically be concealed within the holder when not in use.

Handy safety knives of the type referred to above,
80 are specifically described hereafter which are compact, easy to handle and have a handsome appearance, and can be used not only simply as a knife, but also as an accessory to, for example, a keyholder.

The safety knives described in detail hereafter are
85 inexpensive and can, therefore, be used as disposable throw-away knives.

The invention provides a safety knife comprising a holder defining a chamber having an opening, an elongate blade member mounted for longitudinal
90 sliding movement from a retracted position within the chamber through the opening to a projected position, manually manipulatable means operatively connected to the blade member for moving the blade member between the retracted and the pro-
95 jected positions and means biasing the blade member to the retracted position.

The present invention includes a compact safety knife which comprises a generally flat holder having a chamber and an opening both defined therein, an
100 elongated blade member, a manipulatable member carried by the holder for movement between projected and retracted positions and operatively coupled to the blade member, means for biasing the manipulatable member to the retracted position to
105 hold the blade member in position to be concealed within the chamber, and means for guiding the blade member to move in its longitudinal, straight direction upon the movement of the manipulatable member between the projected and retracted posi-
110 tions.

The opening in the holder communicates between the chamber and the outside of the holder for the passage of the blade member therethrough upon the movement of the manipulatable element. Because
115 the blade slides longitudinally through the opening, only one end portion of the blade member can project outwards from the chamber through the opening and to the outside of the holder and, when the blade member is retracted it is within the
120 chamber. Whilst the movement of the blade member from the projected position to the retracted position is automatically effected by the action of the biasing means once any lock provided for maintaining the projected position is overcome the movement of the
125 blade member from the retracted position to the projected position can be effected by the application of an external force to the manipulatable member against the biasing means.

The biasing means may act on the manipulatable
130 member which is then movable between blade

projecting and blade retracting positions, and may be a spring element such as a leaf spring, a wire spring, a compression spring or a tension spring.

- The holder is preferably constituted by generally
 5 plate-like, first and second holder members joined together with the chamber defined therebetween. In one preferred embodiment, the first and second holder members can be achieved by the use of any suitable bonding agent and/or by the use of a
 10 pin-and-socket arrangement wherein a plurality of pins formed on either one of the first and second holder members are tightly inserted into corresponding sockets formed on the other of the first and second holder members.
- 15 In another preferred embodiment of the present invention, the first and second holder members are integrally connected to each other and the complete holder can be assembled by folding either one of the first and second holder members relative to the
 20 other of the first and second holder members. In order to avoid any possible opening of either one of the first and second holder members relative to the other of the first and second holder members one or both of the bonding agent and a similar pin-and-socket arrangement may be employed. In particular,
 25 where the holder is made up of the integrally connected first and second holder members, it is preferably made of a synthetic resin which may be polyethylene, polypropylene or polyvinyl chloride.
- 30 The handy safety knife according to the present invention may further comprise means for retaining the manipulatable member in the projected position once it has been moved thereto. This retaining means may comprise a wedge member or detent
 35 integrally formed on the holder at a location on the path of movement of the manipulatable member so that, when the manipulatable member is moved to the projected position, it can override the wedge member to exert a frictional force necessary to retain
 40 the manipulatable member in the projected position and overcoming the biasing force of the biasing means tending to move the manipulatable member towards the retracted position. The frictional force so developed to retain the manipulatable member in
 45 the projected position can readily be cancelled merely by applying an external force to the manipulatable member to move the latter towards the retracted position.

These and other features of the present invention
 50 will become apparent from the following description taken in conjunction with preferred embodiments thereof with reference to the accompanying drawings, in which:

Figure 1 is a side elevational view of a handy safety knife according to a first preferred embodiment of the present invention;

Figure 2 is a cross-sectional view, on an enlarged scale, taken along the line II-II in *Figure 1*;

Figure 3 is a side elevational view of one of the
 60 opposed holder segments of the knife shown in *Figures 1* and *2*, showing the manner in which a blade member is operatively carried thereby;

Figure 4 is a side elevational view of the other of the opposed holder segments of the knife shown in
 65 *Figures 1* and *2*, showing the interior surface appear-

ance thereof;

Figure 5 is a view similar to *Figure 1*, showing another preferred embodiment of the present invention;

70 *Figure 6* is a cross-sectional view, on an enlarged scale, taken along the line VI-VI in *Figure 5*;

Figure 7 is a perspective view of the handy safety knife according to a third preferred embodiment of the present invention; and

75 *Figure 8* is a front elevational view of the handy safety knife shown in *Figure 7*.

Before the description of the present invention proceeds, it is to be noted that like parts are designated by like reference numerals throughout the accompanying drawings.

Referring first to *Figures 1* to *4*, a handy safety knife according to a first preferred embodiment of the present invention comprises a generally flat box-like holder 10 including substantially plate-like,
 85 first and second holder segments 12 and 14 of similar configuration. The holder 10 may be of any desired shape, for example, rectangular, polygonal or circular shape or of any other shape generally considered suited or appropriate to render the handy safety knife of the present invention to be used as a mascot or an accessory to a keyholder. However, so far illustrated, the holder 10 is of a generally semi-circular shape so selected as to provide a comfortable and steady holding during the use of
 90 the handy safety knife. Preferably, the holder 10 is of a handful size.

As best shown in *Figures 2* and *3*, the first holder segment 12 has a peripheral wall 16 protruding outwards therefrom in a direction at right angles to
 100 the plane of an inner surface 12a of the first holder segment 12 adjacent the second holder segment 14, a portion of said peripheral wall 16 being cut away at 18 to provide an opening, for example, a slot, in cooperation with the second holder segment 14 in a manner as will be described in details later.

The first holder segment 12 also has a guide slot 20, defined therein and extending a predetermined distance in a direction towards the cut-away portion 18 in the peripheral wall 16, and a pair of like-
 110 positioned and like-oriented guideways 22 and 24 formed around the guide slot 20 and on the inner and outer surfaces 12a and 12b of the first holder segment 12, respectively, and recessed inwardly thereof. The guideways 22 and 24 so formed in the first holder segment 12 are communicated to each
 115 other through the guide slot 20 which, so far illustrated, extends intermediately of the width of any one of the guideways 22 and 24.

The handy safety knife also comprises a manipulatable element, generally identified by 26, of a construction having a generally rectangular cross-section stem 28 having one end integrally formed with a generally disc-shaped slider 30 and a bearing aperture 32 (shown by the phantom line in *Figure 3*,
 120 but best shown in *Figure 6*) defined therein at a position adjacent the other end thereof. Preferably, by the reason which will become apparent from the description concerning the operation of the handy safety knife of the present invention, the bearing aperture 32 is in the form of a slot extending
 130

completely through the stem 28.

This manipulatable element 26 is operatively carried by the first holder segment 12 in such a manner that, while the slider 30 is received in the guideway 24 on the outer surface 12b of the first holder segment 12, the stem 28 extends through the guide slot 20 and terminates outwardly of the guideway 22. The guide slot 20 and the stem 28 are preferably so size and so dimensioned relative to each other as to enable the manipulatable element 26 to move smoothly between projected and retracted positions in the axial direction of and along the guide slot 20 with no possibility of rotating about the longitudinal axis of the stem 28. The distance through which the guide slot 20 extends, that is, the length of the guide slot 20, is determinative of the stroke of movement of the manipulatable element 26 and is determined in consideration of the length of a knife blade employed as will be described later.

However, the manipulatable element 26 is normally biased to the retracted position by the action of a spring element which is, so far illustrated, employed in the form of a wire spring 34 of a type having its substantially intermediate portion coiled at 34a.

Referring still to Figures 2 and 3, the wire spring 34 is supported by the first holder segment 12 with the coiled portion 34a mounted on a support pin 35 integrally formed with the first holder segment 12 and protruding outwardly from the inner surface 12a at a position corresponding to one of the apexes of the imaginary triangular shape having the other two apexes substantially occupied by the opposed ends of the guideway 22. The wire spring 34 so supported has one end 34b engaged to the peripheral wall 16 and the other end 34c loosely inserted through the bearing aperture 32 such that the manipulatable element 26 can be biased to the retracted position by the action of said wire spring 34 as hereinbefore described.

The elongated knife blade is identified by 36 and has a mounting aperture 38 defined therein, said mounting aperture 38 having a shape complementary to the cross sectional shape of the stem 28 of the manipulatable element 26 and a width substantially equal to or slightly smaller than the width of the guideway 22. This knife blade 36 is mounted on the manipulatable element 26 with the stem 28 extending through the mounting aperture 38 and is, while seated in the guideway 22, positioned between the first holder segment 12 and the end 34c of the wire spring 34 as best shown in Figure 2.

The second holder segment 14 has one surface formed with an elongated recess 40 for receiving the free end of the stem 28 and a guide block 42 protruding outwards from the second holder segment 14 a predetermined distance which may be equal to or substantially equal to the distance through which the peripheral wall 16 protrudes outwards from the first holder segment 12. This guide block 42 is, when the second holder segment 14 is joined to the first holder segment 12 in a manner as will be described later, received in the cut-away portion 18 in the peripheral wall 16 to define the slot (not shown in Figures 1 to 4, but identified by 44 in Figure 8) of a width slightly larger

than the thickness of the knife blade 36, through which slot 44 the knife blade 36 can reciprocally move during the movement of the manipulatable element 26 between the projected and retracted positions. It is to be noted that, where the peripheral wall 16 projects from the plane of the inner surface 12a of the first holder segment 12 a distance equal to or slightly larger than the distance through which the free end of the stem 28 projects from the plane of the inner surface 12a of the first holder segment 12, the elongated recess 40 may be eliminated. However, the use of the elongated recess 40 is advantageous in that the thickness of the handy safety knife itself can be reduced.

The first and second holder segments 12 and 14 are joined together by the use of a suitable bonding agent. However, in order to minimize the number of manufacturing steps, the use of a pin-and-socket arrangement is preferred. This pin-and-socket arrangement comprises, although not shown in Figures 1 to 6, but shown in Figure 7, one or more pins 46 formed on either one of the inner surfaces of the respective first and second holder segments 12 and 14, for example, the inner surface of the first holder segment 12, and a corresponding number of sockets 48 formed on the other of the inner surfaces of the respective first and second holder segments 12 and 14, that is, the inner surface of the second holder segment 14. The pin-and-socket arrangement is so designed that, when the first and second holder segments 12 and 14 are joined to each other with the guide block 42 received in the cut-away portion 18 in the peripheral wall 16, the pins 46 are tightly inserted into the respective sockets 48. It is to be noted that the pin-and-socket arrangement may be employed concurrently with the use of the suitable bonding agent.

While the handy safety knife is constructed in the manner described above, it can be used in the following manner. When and so long as the manipulatable element 26 is held in the retracted position by the action of the wire spring 34, the knife blade 36 is entirely concealed within the holder 10. When the tip of the knife blade 36 facing towards the slot 44 (Figure 8) is desired to be exposed out of the holder 10 in readiness for the actual use of the handy safety knife in, for example, paper cutting, what is required is to apply an external pushing force to the slider 30 in a direction counter to the direction in which the biasing force of the wire spring 34 tending to urge the manipulatable element 26 towards the retracted position acts.

As the external force is so applied to the slider 30, the manipulatable element 26 moves against the wire spring 34 in a direction towards the projected position, accompanied by a corresponding sliding movement of the knife blade 36 with the tip of the knife blade 36 gradually protruding out of the holder 10 through the slot 44 (Figure 8). Figures 1 and 2 show the condition in which the manipulatable element 26 is moved to the projected position.

Subsequent release of the external pushing force from the slider 30 results in automatic return of the manipulatable element 26 back to the retracted position with the knife blade 36 concealed within the

holder 10.

It is to be noted that, because of the bearing aperture 32 in the stem 28 employed in the form of a slot, the end 34c of the wire spring 34 can undergo an arbitrary motion within the bearing aperture 32 without any possibility of the end 34c of the wire spring 34 being bent. Although the handy safety knife according to the present invention can operate satisfactorily even if the bearing aperture 32 is employed in the form of a circular cross-sectioned hole of a diameter substantially equal to the diameter of the wire spring 34, this would involve such a possibility that, particularly during the movement of the manipulatable element 26 from the retracted position towards the projected position, the end 34c of the wire spring 34 tends to bend while axially moving through the bearing aperture 32 and, therefore, the gradually increased external pushing force will be required to move the manipulatable element 26 towards the projected position.

It is also to be noted that the use of the wire spring 34 of a type having its substantially intermediate portion 34a coiled is advantageous in that, when the manipulatable element 26 is moved to the projected position as shown in Figures 1 and 3 with the tip of the knife blade 36 exposed outside the holder 10 through the slot 44 (Figure 8) in readiness for the actual use of the handy safety knife in, for example, paper cutting, a portion of the knife blade 36 adjacent the exposed tip thereof and situated within the slot 44 is shifted upwardly as viewed in Figure 3 substantially pivoting about the stem 28 of the manipulatable element 26. This is possible because the end 34c of the wire spring 34, when moved in a direction close towards the end 34b of the same wire spring 34 incident to the movement of the manipulatable element 26 to the projected position, acts to depress a portion of the stem 28 on the trailing side with respect to the direction of movement of the manipulatable element 26 towards the projected position with the manipulatable element 26 tending to rotate counterclockwise, as viewed in Figure 3, about the longitudinal axis of the stem 28. Therefore, there is no possibility of the knife edge of the knife blade 36 contacting the adjacent portion of the peripheral wall 16 when the manipulatable element 26 is in the projected position. In addition, the use of the wire spring 34 of the type referred to above involved such an additional advantage that the knife blade 36 can slightly be forced to contact the inner surface 12a of the first holder segment 12 by the action of the end 34b of the wire spring 34 because of the coiled portion 34a acting in a manner similar to a tension spring.

According to the first preferred embodiment of the present invention which has been described with reference to Figures 1 to 4, the continued application of the external pushing force to the slider 30 is required during the actual use of the handy safety knife. Accordingly, when the handy safety knife held in one of the hands of a user is shifted to the other hand by some reason, the knife blade 36 is automatically concealed within the holder 10 by the action of the wire spring 34 and, therefore, the external pushing force must be again applied to the slider 30

to expose the knife blade 36 out of the holder 10.

This may be inconvenient and, in order to avoid this, the handy safety knife according to the present invention may have means for retaining the manipulatable element 26 in the projected position once it has been moved thereto and unless an external release force is applied, which will now be described with particular reference to Figures 5 and 6.

Referring now to Figures 5 and 6, the means for retaining the manipulatable element 26 in the projected position comprises a wedge 50 in the form of a projection formed on the outer surface 12b of the first holder segment 12 and inside the guideway 24 and projecting a slight distance from the first holder segment 12. This wedge 50 is so positioned that, when the manipulatable element 26 is moved to the projected position, the slider 30 slides over the wedge 50 with a portion of the slider 30 elastically deformed outwards in a direction away from the first holder segment 12 in contact with the tip of the wedge 50 as best shown in Figure 6. This can be accomplished by employing a synthetic resin, for example, polyethylene, polypropylene or polyvinyl chloride, as a material for at least the manipulatable element 26. Alternatively, all of the components of the handy safety knife except for the knife blade 36 may be made of a synthetic resin.

The manipulatable element 26 retained in the projected position with the slider 30 riding over the wedge 50 while a friction is developed between the slider 30 and the wedge 50 in an amount sufficient to overcome the biasing force of the wire spring 34 can be allowed to return automatically back to the retracted position by the action of the wire spring 34 when a slight external pushing force is applied to the slider 30 to move the latter in a direction towards the retracted position.

Although in the embodiment shown in Figures 5 and 6 the wedge 50 has been described as positioned to enable the slider 30 to ride over it when the manipulatable element 26 is moved to the projected position, it may be positioned on a peripheral wall defining the guideway 24 so that, when the manipulatable element 26 is moved to the projected position, the wedge 50 can relatively wedge into a clearance between the perimeter of the slider 30 and the wall defining the guideway 24.

In either case, the slider 30 may have a detent recess adapted to receive the wedge 50 therein when the manipulatable element 26 is moved to the projected position.

In any one of the foregoing embodiments of the present invention shown respectively in Figures 1 to 4 and Figures 5 and 6, the first and second holder segments 12 and 14 are separately manufactured by the utilization of any known plastic molding technique, for example, either an extrusion molding method or an injection molding method. This means that the use of separate molds for the respective holder segments 12 and 14 is required, involving a relatively high manufacturing cost. However, the holder of a construction shown in Figures 7 and 8 does not require the use of separate molds and, therefore, can readily be manufactured without involving the increased manufacturing cost.

Referring now to Figures 7 and 8, the first holder segment 12, including a peripheral wall 16, and the second holder segment 14 including the guide block 42 are of one-piece construction. Specifically, the first and second holder segments 12 and 14 are integrally connected with each other and are foldable together in a manner similar to butterfly wings. More specifically, one side edge of a portion of the peripheral wall 16 opposite to the first holder segment 12 is integrally formed with the second holder segment 14 in a manner pivotable about a line axis identified by X, while the second holder segment 14 is so sized as to be received inside the peripheral wall 16 in the first holder segment 12.

While the line axis X is so positioned as to enable the pins 46 to be tightly received in the corresponding sockets 48 when the first and second holder segments 12 and 14 are folded together, the portion of the peripheral wall 16 and a portion of the second holder segment 14 adjacent that portion of the peripheral wall 16 are so chamfered at 14a and 16a, respectively, in complementary relation to each other that, when the first and second holder segments 12 and 14 are folded together, the plane of the outer surface of the second holder segment 14 can lie at right angles to the plane of the outer peripheral face of the peripheral wall 16 as best shown in Figure 8.

From the foregoing, it will readily be seen that the handy safety knife according to the embodiment shown in Figures 7 and 8 can operate in a manner similar to the operation of that shown in Figures 1 to 4.

In any event, the handy safety knife according to any one of the foregoing embodiments can readily be assembled without requiring the use of any tool such as jig. Specifically, once the first holder segment 12, the manipulatable element 26, the knife blade 36 and the wire spring 34 have been assembled together in the manner as hereinbefore described, there is no possibility of separation of these component parts from each other even if the assembly of these component parts is placed on a surface such as a table with either one of the inner and outer surfaces 12a and 12b of the first holder segment 12 oriented downwards. In other words, once the component parts 12, 26, 34 and 36 have been assembled together, the wire spring 34 retains the other component parts in position. Therefore, the assemblage of the complete handy safety knife according to the present invention does not require the attendance of skilled workers and can be done at a reasonably reduced cost.

Although the present invention has fully been described in connection with the preferred embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications are apparent to those skilled in the art. By way of example, the peripheral wall 16 which has been described as formed on the first holder segment 12 may be formed on the second holder segment 14 and, in this case, the use of the guide block 42 can be eliminated. In addition, both of the guideways 22 and 24 may not be always necessary if the stem 28 is of a sufficient size as to avoid the

rotation of the manipulatable element 26 about the longitudinal axis of the stem 28 on one hand and, on the other hand, the retracted position of the manipulatable element 26 is so selected that, when the manipulatable element 26 is held in the retracted position, the tip of the knife blade 36 adjacent the slot 44 can be positioned intermediately of the thickness of the peripheral wall 16.

Moreover, although the elongated knife blade 36 has been shown as having a knife edge extending along one side thereof, it may have a knife edge at one end portion thereof adjacent the slot 44.

Furthermore, since the external pushing force is applied to the slider 30 during the use of the handy safety knife of the present invention by way of a finger of the user, a surface area of the slider 30 opposite to the stem 28 may have a plurality of indentations, such as shown, to avoid any possible slip of the user's finger relative to the slider 30.

In addition, at least one of the first and second holder segments 12 and 14, preferably the second holder segment 14, may be made of a synthetic resin containing a magnetic powder distributed therein so that the handy safety knife of the present invention can be used not only as a knife itself but also a magnet paper holder for holding a paper or the like sheet material to a magnetizable wall by the utilization of a magnetic attraction force.

Accordingly, such changes and modifications are to be understood as included within the true scope of the present invention unless they depart therefrom.

CLAIMS

1. A safety knife comprising a holder defining a chamber having an opening, an elongate blade member mounted for longitudinal sliding movement from a retracted position within the chamber through the opening to a projected position, manually manipulatable means operatively connected to the blade member for moving the blade member between the retracted and the projected positions, and means biasing the blade member to the retracted position.
2. A safety knife as claimed in claim 1, wherein the holder is substantially flat.
3. A safety knife as claimed in claim 1 or claim 2, wherein the manipulatable member is movable between blade-retracting and blade-projecting positions and the means biasing the blade member to the retracted position acts on the manipulatable member.
4. A knife as claimed in claim 1, wherein said holder is constituted by substantially plate-like, first and second holder members joined together in face-to-face relation with each other, said chamber being defined between the first and second holder members.
5. A knife as claimed in claim 2, wherein the chamber contains an elongated groove of a width substantially equal to or slightly greater than the width of the blade member, said groove being defined on the inner face of one holder member and having one end terminating in the opening, for

guiding the blade member in its sliding movement.

6. A knife as claimed in any preceding claim, wherein said manipulatable member is constituted by a generally flat slider positioned externally of the holder and a stem having one end integrally formed with said slider and extending through a guide slot in the holder extending in a direction parallel to the direction of movement of the blade member the stem then extending through the blade member and terminating in the chamber.

7. A knife as claimed in claim 6, wherein said biasing means comprises a wire spring having one end loosely inserted through a slot formed in the stem adjacent the free end thereof and the other end engaged to the chamber wall, an intermediate portion thereof being mounted on a mounting projection protruding from the chamber wall.

8. A knife as claimed in any preceding claim, further comprising means for retaining the manipulatable member in the projected position once it has been moved thereto.

9. A knife as claimed in claim 8, wherein the retaining means is a detent on the outer surface of the housing over which the manipulatable member snaps in when the blade is projected.

10. A knife as claimed in any one of claims 2 to 9, wherein said first and second holder members are integrally formed with each other and have a common line of bending about which said first and second holder members are folded together to provide the complete holder.

11. A compact safety knife which comprises a generally flat holder having a chamber and an opening, both defined therein, said opening communicating between the chamber and the outside of the holder; an elongated blade member; a manipulatable member carried by the holder for movement between projected and retracted positions and operatively coupled to the blade member, said manipulatable member when in the projected position permitting only one end portion of the blade member to project outwards from the chamber through the opening and, when in the retracted position, permitting the blade member to be concealed within the chamber; means for biasing the manipulatable member to the retracted position, said manipulatable member being moved to the projected position against said biasing means when an external force sufficient to overcome the biasing force exerted by said biasing means is applied to the manipulatable member and means for guiding the blade member to move in its longitudinal, straight direction during the movement of the manipulatable member between the projected and retracted positions.

12. A knife substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 4 or 5 to 10 of the accompanying drawings.

New claims or amendments to claims filed on 17th April 1980

Superseded claims 1 to 12.

New or amended claims:-

1. A safety knife comprising a holder defining a chamber having an opening, an elongate blade

member mounted for longitudinal sliding movement from a retracted position with the chamber through the opening to a projected position, manually manipulatable means operatively connected to the blade member for moving the blade member between the retracted and the projected positions, and means biasing the blade member to the retracted position, wherein the manipulatable member is constituted by a slider positioned externally of the holder and a stem having one end integrally formed with said slider and extending through a guide slot in the holder extending in a direction parallel to the direction of movement of the blade member the stem then extending through the blade member and terminating in the chamber, and the biasing means comprises a wire spring having one end loosely inserted through a slot formed in the stem adjacent the free end thereof and the other end engaged to the chamber wall, an intermediate portion thereof being mounted on a mounting projection protruding from the chamber wall.

2. A safety knife as claimed in claim 1, wherein the holder is substantially flat.

3. A knife as claimed in claim 1, wherein said holder is constituted by substantially plate-like, first and second holder members joined together in face-to-face relation with each other, said chamber being defined between the first and second holder members.

4. A knife as claimed in claim 2, wherein the chamber contains an elongated groove of a width substantially equal to or slightly greater than the width of the blade member, said groove being defined on the inner face of one holder member and having one end terminating in the opening, for guiding the plate member in its sliding movement.

5. A knife as claimed in any preceding claim, further comprising means for retaining the manipulatable member in the projected position once it has been moved thereto.

6. A knife as claimed in claim 5, wherein the retaining means is a detent on the outer surface of the housing over which the manipulatable member snaps in when the blade is projected.

7. A knife as claimed in any one of claims 2 to 6, wherein said first and second holder members are integrally formed with each other and have a common line of bending about which said first and second holder members are folded together to provide the complete holder.

8. A knife as claimed in any one of claims 2 to 6 wherein the first and second holder members are initially separate members assembled together.

9. A compact safety knife which comprises a generally flat holder having a chamber and an opening, both defined therein, said opening communicating between the chamber and the outside of the holder; an elongated blade member; a manipulatable member carried by the holder for movement between projected and retracted positions and operatively coupled to the blade member, said manipulatable member when in the projected position permitting only one end portion of the blade member to project outwards from the chamber through the opening and, when in the retracted position,

permitting the blade member to be concealed within the chamber; means for biasing the manipulatable member to the retracted position, said manipulatable member being moved to the projected position
5 against said biasing means when an external force sufficient to overcome the biasing force exerted by said biasing means is applied to the manipulatable member and means for guiding the blade member to move in its longitudinal, straight direction during
10 the movement of the manipulatable member between the projected and retracted positions wherein the manipulatable member is constituted by a slider positioned externally of the holder and a stem having one end integrally formed with said slider
15 and extending through a guide slot in the holder extending in a direction parallel to the direction of movement of the blade member the stem then extending through the blade member and terminating in the chamber, and the biasing means comprises
20 a wire spring having one end loosely inserted through a slot formed in the stem adjacent the free end thereof and the other end engaged to the chamber wall, an intermediate portion thereof being mounted on a mounting projection protruding from
25 the chamber wall.

10. A knife substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 4 or 5 to 10 of the accompanying drawings.